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How Can Cost Work Be Simplified Without Impairing Accuracy

BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK

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Some plant owners, although recognizing the benefits to be derived from a cost accounting system, have often hesitated to have an installation made because of the fear that the cost of operating it will be too heavy. In many instances their fear has had a basis of fact. It is a usual practice of accountants to provide in the installation for the securing of all information which will probably be needed. Analysis of data before record rather than afterwards is fundamentally a sound practice. However, every installation should take cognizance of the immediate conditions to be met in order to make the system successful from every point of view.

The author of this Official Publication has had this situation in mind and points out some of the places where costs of operating the cost system may be cut down. Before deciding where costs may be cut, a careful analysis of the uses of the data derived is necessary. If absolutely accurate data are needed because of the seriousness of the official decisions dependent thereon, manifestly whatever costs are necessary to secure accurate data must be incurred. This is no place for cutting costs; unreliable data are more harmful oftentimes than none at all. After determining where costs may be cut, the author suggests the manner of making the cuts.

Since 1912 Mr. Corregan has been employed in accounting and financial work for the General Electric Company and associated interests. Since 1923, as assistant general auditor, he has been in general charge of accounting relating to all manufacturing operations, and cost research and analysis work.

It has been his good fortune to participate actively in the development of the Business Training Course of General Electric Company, by means of which college and high school graduates are afforded the opportunity of an intensive training in the theory of elementary and advanced accounting, auditing and industrial analysis and control, and its practical application in the affairs of a large manufacturing corporation. In this course he has served as a special lecturer on industrial analysis and control.

HOW CAN COST WORK BE SIMPLIFIED WITHOUT IMPAIRING ACCURACY

It would be desirable, at the outset, to have a common understanding of the meaning of the term "costs," and of the importance of accuracy. For the purpose of this discussion the term "costs" comprehends all tabulations of financial data, compilations of the costs of individual products, statements of expenses, etc., required for the administration and control of the various activities of a business, including selling, engineering, manufacturing and incidental functions.

The question of accuracy involves a consideration of the purposes for which costs are used. These are three, in general:

1. As a basis for determining selling prices, directing and

controlling selling activities, and regulating commercial policies.

2. As a means of controlling expenditures and directing and controlling productive activities.

3. For the purpose of costing output and shipments, and relieving inventory accounts.

Accuracy is extremely important in the case of cost data used as a basis for selling prices and commercial policies. Upon it depends, to a large extent, the success or failure of an enterprise. If, as a consequence of incorrect costs, selling prices are too high, intangible and often direct losses may result because of inability to accept business which would in fact be profitable. On the other hand, selling prices which are lower than they should be may lead to securing orders which result in a direct loss.

In either case, the effect is apt to be far reaching. In many instances, the occasion for quoting a price arises only after considerable sales effort, demonstrating the merits of the products and arousing the customer's interest therein. If then, because of inaccurate cost data, the price quoted is higher than would be necessary to yield a fair net margin, the business may be lost and the selling effort and expense will have been in vain. Often the effect extends beyond an individual transaction. This occurs when products are of such a nature that the customer considers it advisable, and sometimes essential, to obtain additional requirements from the same source of supply. An illustrative case is that of a customer, who, having purchased one piece of apparatus—engine, machine tool or electrical apparatus—is in need of another. The tendency would be to duplicate the first one, with a view to standardization of equipment and to preclude the necessity of carrying repair or renewal parts for two makes. Again, in the case of accessories which are incorporated in or affixed to the products of the customer. Often changes are necessary to permit of the adaptation of the accessories. Once a customer has made these changes, he is disinclined to modify his products again to permit of the use of a slightly different type. This situation is found frequently in the automobile industry. Furthermore, the problem of supplying renewal parts of accessories is an important factor. If a customer changes the make of accessories frequently, he is confronted with the necessity of either stocking and cataloging renewal parts for each make so as to service his customers promptly, or of imposing upon the latter the difficulties, confusion and delay of determining from whom parts may be obtained. Because of these and other factors, the effect of an unreasonably high price due to inaccurate costing may be to delay for several years the opportunity of again interesting a customer.

The effect of quoting unreasonably low prices is sometimes even more harmful, because of the possible effect upon the level of prices for an industry as a whole. Take the case of a manufacturer who sells to his customers at unreasonably low prices, because based upon incorrect costs, due, for example, to failure to include

proper depreciation charges. Other manufacturers may be forced to quote correspondingly lower prices to meet competition. A price level then becomes established which it is difficult later to raise.

The foregoing cases emphasize the importance of accuracy in cost data upon which to base selling prices. Commercial policies, also, often are contingent upon costs. The policy to be followed with respect to allowing special discounts for quantity purchases affords a good illustration. Fundamentally, such discounts should extend to customers the economies made possible by reason of their purchasing relatively larger quantities. The problem of determining the effect upon costs is a complicated one, and involves a consideration of such questions as:

(1) Shall discounts apply to individual transactions or to aggregate purchases during a fixed period?

(2) Shall they apply to purchases of individual products or to mixed purchases?

(3) Shall the same schedules of discounts be offered to all classes of customers?

Obviously, an intelligent and safe policy can be decided upon only if the circumstances incidental to each class of transaction and their effect upon costs are accurately determined.

Accuracy is very important, also, in cost data used as a means of controlling all classes of expenditures, and as a basis for manufacturing policies. The effective control of expenditures is vital. The income from a given volume of output, except in the case of cost-plus contracts, is usually limited to the selling price fixed in advance of actual manufacture. If the expenditures in the production of the output and in the incidental functions exceed the amounts provided for in the selling prices, profits will be lower than anticipated or even a loss may be sustained. The possibility of excessive expenditures is ever present because of circumstances and conditions, oftentimes unforeseen, which may arise in the course of production. It is essential, therefore, to have current cost data as a means of checking the amounts expended and these data must be accurate. If these data indicate that expenditures are lower than they actually are, consequent failure to take drastic action may lead to future grief. Errors on the other side may lead to action which might be detrimental to the best interests, such as substitutions, changes in labor rates, curtailment of activities which otherwise would be carried forward with ultimate benefits.

Manufacturing policies are often directly dependent upon cost facts. Such policies may have reference to the continuity of employment of labor; the economical units of purchase and production; the provision of manufacturing facilities, the types to be selected and the arrangement thereof, etc. The importance of such policies and their bearing upon the financial results dictate the need for extreme accuracy in the determination of the cost data upon which they are based.

The importance of correctly stating the values of inventories in the balance sheet is not to be belittled, and these values are contingent in part upon the accuracy with which output and shipments are costed. There are other factors, however, which have a bearing upon the current statement of such valuations. Changes in market prices of materials cannot ordinarily be taken into account immediately, and the effect of such changes extends, of course, to the values of work-in-process and finished goods. It is usually impracticable to record, as they occur, the reductions in the value of inventories due to the inactivity and obsolescence of the merchandise. Losses due to leaks, breakage and shortages occur from day to day which cannot be identified and recorded. These factors and others give rise to discrepancies in inventories which become apparent, and can be taken into account only when a physical count and revaluation of the merchandise is made. Interim adjustments, with a view to keeping the accounts in accord with current facts, should, of course. in so far as may be practicable, be made as the need for them becomes apparent. Despite the best efforts and perhaps considerable expense, discrepancies will arise. It seems reasonable, under the circumstances, that the requirements of accuracy, in relieving the inventories of output and shipments, should be somewhat less stringent than for commercial purposes and for control of expenditures. In other words, for current inventory valuations a practicable degree of accuracy should suffice.

Another purpose of costing shipments is the determination of profit and loss results at more frequent intervals than often would be possible if based upon physical inventories. For this purpose, also, a practicable degree of accuracy should suffice. At best, interim profit and loss statements are but a general indication of results and are not to be taken too literally. They are subject to modification because of inventory discrepancies, and for short periods may not be true indications, due to the lag between changes in costs and selling prices. To illustrate, let us assume that selling prices are revised as of January 1, and that allowances are made for anticipated increases in market prices of commodities or in labor rates. Products may be sold and billed at the new prices which were manufactured from materials purchased before the increase in prices thereof became effective, or which were partly or entirely processed before the change in labor rates occurred. Under such circumstances the profit and loss results for a short period are not truly indicative. Then, too, the contra-condition of current selling prices relatively lower than those of materials or rates of labor frequently occurs.

Summarizing the foregoing, extremely accurate cost data are essential for the purpose of fixing selling prices; as a basis for commercial policies; and also for controlling expenditures. A practicable degree of accuracy is sufficient for the purpose of costing output and shipments.

Somewhat different data are required for each purpose. Costs (total costs) upon which selling prices are based involve, to a greater or lesser degree, a factor of estimate. This is true either because they relate to new products not previously manufactured or because allowance must be made for anticipated changes in material prices or labor rates. For this reason such costs may be of little value for other purposes.

Total costs, i. e., the costs of production plus commercial and other expenses, including such factors as spoilage losses, etc., are of comparatively little value for the purpose of controlling expenditures; they do not permit of a sufficiently detailed visualization of activities. For this purpose the material and direct labor elements per unit should be dealt with separately and should often be shown in detail according to operations and component parts. The expense elements per unit are of little value as a basis of control. These items must be dealt with in the aggregate and gauged by total direct labor expenditures, by hours, or by some other standard representing the extent of the activities which occasion the expense.

Total costs are required for costing shipments, but they may differ from those used for commercial purposes, because based upon actual prices of materials and labor and not involving the factor of estimating market trends.

The variety of cost data required for all purposes gives rise to the possibility of a complicated and very expensive system of records, unless every effort towards simplicity is constantly made. Furthermore, an elaborate and complex system usually fails to accomplish effectively the purposes for which it was designed. How the best results may be obtained with the greatest simplicity and with a minimum of expense is a difficult problem, the solution of which requires an intimate knowledge of the circumstances affecting each case, sound judgement, and a close cooperation between the commercial, manufacturing, and engineering departments and the cost accountant. There are, however, certain fundamental principles to be borne in mind.

One fact which will serve to illustrate what is meant by the above statement is that selling prices for a line of products varying in size, finish, etc., are not always determined by precise calculation, i. e., by adding a definite margin of profit to actual total cost. There are a number of factors to be considered. Prices of products similar in nature often must be basically uniform, according to their service value, irrespective of differences in cost. Let us assume, for example, that the standard color of an automobile selling for $2,000 is black and that there is a fairly good demand for cars painted red. Because of the interruption of regular production and other delays and difficulties incidental to producing the off-standard cars, the actual difference in cost may be $200. If $2,500 were asked for the red car, the chances are that the prospective purchaser would decide on another make. Again, let

us assume that the prices of standard motors of 7½ and 10 horsepower capacity are $200 and $250, respectively, and that a prospective purchaser requires a motor capable of developing 9 horsepower, the actual cost of which, because of its off-standard capacity, is $100 more than the 7½ horsepower motor, and $50 more than the 10 horsepower. Commercial policy might, nevertheless, indicate the desirability of quoting a price no higher than that for the 10 horsepower machine.

The principle of basic uniformity in prices usually results in the selection of a particular type, size, gauge, etc., of product as a standard with respect to which the prices for similar products are fixed, maintaining a reasonable scale of differentials or gradations. When this policy is pursued the cost work may be simplified and minimized if efforts are devoted to the determination of the costs of the basic or representative products. Changes in these costs are the guide for adjusting selling prices for the whole line. Of course, the actual costs of each type should be compiled from time to time, and the variations from the standard verified, but the latter data are usually not required as frequently as the costs of the standards.

An effective control of expenditures for material and labor can oftentimes be accomplished through the medium of one or a few representative types of products. This is possible because whatever circumstances or conditions affect the representative type of a line will have a bearing on other types. Furthermore, the remedies applied in the case of the standards will ordinarily be extended to the whole line. Oftentimes an effective control of expenditures relating to several lines which are slightly different can be had by selecting the most representative unit of the several types as a standard and then dealing with only the differences in form, construction, or finish between the standard and the other types.

As previously stated, control of manufacturing and other expenses cannot be very well accomplished with data concerning the expense per unit. It is necessary to deal with the total of each class of expense and its relation to some standard of service received. The control can be simplified if, instead of analyzing the expenditures for each period, budgets are prepared for various volumes of production, etc., and the actual expenditures are compared with the predetermined or estimated amounts and are expressed as ratios of attainment, that is, the percentages of the expenditures to the budget.

A practicable degree of accuracy can be attained in the costing of shipments by basing the costs upon representative types of products. This practice necessitates the determination of a schedule of relative percentages or amounts. These percentages will represent the differences between the total costs (in some cases by elements) of the standards and of the other types. Changes in costs can be more readily applied throughout a line if percentage

differentials are used. Thus, if the cost of a standard be $1.00 and of another type $1.20, the shipments of the latter can be priced at the cost of the standard plus 20%. Then, if material prices or labor rates change, only the cost of the standard need be revised. Of course, care must be exercised in adopting a scheme of differentials, to provide for variations which may arise due to a disproportionate effect of changes in material prices, labor rates, or amounts of expense per unit.

When a job order cost system is used, it is sometimes unnecessary to compile detail costs for the purpose of costing shipments. The total costs of each job or lot may be used.

Oftentimes, when a variety of products is manufactured which pass through different processes, it is necessary to differentiate in the expense applicable to each type. One type may be made very largely with the aid of machinery and another require the use of only bench facilities. Ordinarily the overhead applicable to the first product will be higher because of depreciation, power and other charges. For the purpose of fixing selling prices, proper differentiation in the expense applicable to each type must, of course, be made. However, if the quantities of each class shipped bear a uniform relation to each other, for purposes of accounting and costing shipments, a composite or weighted rate of expense may be used. For illustration, if the rates of expense for two lines of products are 100% and 160% of direct labor, and the relation of shipments is quite uniformly 2 to 1, respectively, a composite rate of 120% may be used (1-3 of 200% plus 160%).

In some cases, when standard products are made, it is unnecessary to cost each shipment. Rather, the total shipments during a week or month may be analyzed according to the quantities of each class of products, and the totals of each class during the period costed at one time.

The possibilities of simplification which have been suggested are not by any means the only ones nor are they applicable in every case. They are, it is hoped, of value in suggesting what may be done if the problem of cost determination is considered in a practical way. There are limits to the amounts which may be spent for such work, so that if more detailed—often merely historical—compilations are avoided or obviated there will be more time to devote to cost data that will serve to accomplish worthwhile results. The opportunity for this is usually big and the possibilities almost unlimited.

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